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Technical Report 741

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Project A:  
Improving the Selection, Classification, and  
Utilization of Army Enlisted Personnel

## Development of a Model of Soldier Effectiveness

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Selection and Classification Technical Area  
Manpower and Personnel Research Laboratory



U. S. Army

Research Institute for the Behavioral and Social Sciences

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<p>The research described was performed under Project A, the U.S. Army's current, large-scale manpower and personnel effort for improving the selection, classification, and utilization of Army enlisted personnel. It is part of the effort to develop dimensions of soldier performance to be reflected in "Army-wide" rating scales for use in evaluating first-term soldiers in any Military Occupational Specialty (MOS). A review of the literature and previous experience with enlisted Army soldiers provided the basis for a preliminary conceptual model of individual soldier effectiveness. Behavioral analysis workshops involving 77 officers and noncommissioned officers then provided more than 1,300 examples of effective and ineffective soldier behavior. Another 61 officers and NCOs sorted these examples into categories and rated the effectiveness level for each behavior. Seventy-eight percent of the examples were consistently retranslated into a single category within a narrow range of effectiveness. Comprehensive behavioral definitions were prepared for each of the 11</p> <p style="text-align: right;">(continued)</p>				
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dimensions represented, and behavior-based rating scales for use as Army-wide criteria in Project A validation research were developed. This Technical Report is supplemented by ARI Research Note 87-29, Development of a Model of Soldier Effectiveness: Retranslation Materials and Results.

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**Project A:**  
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## FOREWORD

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This document is a description of research performed to develop dimensions of soldier performance to be reflected in "Army-wide" rating scales in the Army's current, large-scale manpower and personnel effort for improving the selection, classification, and utilization of Army enlisted personnel. The thrust for the project came from the practical, professional, and legal need to validate the Armed Services Vocational Aptitude Battery (ASVAB--the current U.S. military selection/classification test battery) and other selection variables as predictors of training and performance.

Project A is being conducted under contract to the Selection and Classification Technical Area (SCTA) of the Manpower and Personnel Research Laboratory (MPRL) at the U.S. Army Research Institute for the Behavioral and Social Sciences. The portion of the effort described herein is devoted to the development and validation of Army Selection and Classification Measures, and referred to as "Project A." This research supports the MPRL and SCTA mission to improve the Army's capability to select and classify its applicants for enlistment or reenlistment by ensuring that fair and valid measures are developed for evaluating applicant potential based on expected job performance and utility to the Army.

Project A was authorized through a Letter, DCSOPS, "Army Research Project to Validate the Predictive Value of the Armed Services Vocational Aptitude Battery," effective 19 November 1980; and a Memorandum, Assistant Secretary of Defense (MRA&L), "Enlistment Standards," effective 11 September 1980.

In order to ensure that Project A research will achieve its full scientific potential and be maximally useful to the Army, a governance advisory group comprised of Army General Officers, Interservice Scientists, and experts in personnel measurement, selection, and classification was established. Members of the latter component provide guidance on technical aspects of the research, while general officers and interservice scientists oversee the entire research effort; give military judgment; provide periodic reviews of research progress, results, and plans; and coordinate within their commands. Members of the General Officers' Advisory Group include MG Porter (DMPM) (Chair), MG Briggs (FORSCOM, DCSPER), MG Knudson (DCSOPS), BG Franks (USAREUR, ADCSOPS), and MG Edmonds (TRADOC, DCS-T). The General Officers' Advisory Group was briefed in May 1985 on the issue of obtaining proponent concurrence of the criterion measures before the concurrent validation. Members of Project A's Scientific Advisory Group (SAG), who guide the technical quality of the research, include Drs. Milton Hakel (Chair), Philip Bobko, Thomas Cook, Lloyd Humphreys, Robert Linn, Mary Tenopir, and Jay Uhlener. The SAG was briefed in October 1984 on the results of the Batch A field test administration. Further, the SAG was briefed in March 1985 on the contents of the proposed Trial Battery.

A comprehensive set of new selection/classification tests and job performance/training criteria has been developed and field tested. Results from the Project A field tests and subsequent concurrent validation will be used to link enlistment standards to required job performance standards and to more accurately assign soldiers to Army jobs. Behavioral definitions for the categories in the model of soldier effectiveness might be used by first-term

soldiers for self-development and by NCOs to develop the soldiers they supervise. The comprehensive definitions of effective and ineffective behavior related to each category provide performance requirements for first-term soldiers. This feature should be useful in identifying aspects of performance that need improvement.

A handwritten signature in cursive script, reading "Edgar M. Johnson".

EDGAR M. JOHNSON  
Technical Director

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The authors thank Alan Lau, Hilda Wing, Mike Rumsey, Karen Mitchell, and Paul van Rijn of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) for their thoughtful comments on an earlier draft of this report. Barry Riegelhaupt and Carolyn DeMeyer Harris of the Human Resources Research Organization (HumRRO) provided skilled assistance at various stages of scale development work. Barry Riegelhaupt and Jim Harris of HumRRO and Darlene Olson and Len White of ARI provided invaluable help with the behavioral analysis workshops.



## DEVELOPMENT OF A MODEL OF SOLDIER EFFECTIVENESS

### EXECUTIVE SUMMARY

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#### Requirement:

Project A is a large-scale, multiyear research program intended to improve the selection and classification system for initial assignment of persons to U.S. Army Military Occupational Specialties (MOS). Experimental predictors (e.g., vocational interest measures and computerized perceptual tests) are being developed to forecast job performance in the different MOS. To assess the validity of these predictors, special performance measures are also being developed. This report describes the development of "Army-wide" rating scales to be used in evaluating soldier performance in any MOS, and includes (a) developing a preliminary model of first-term soldier effectiveness; (b) conducting behavioral analysis workshops with noncommissioned officers (NCOs) and officers; (c) retranslating performance examples into the empirical model's dimensions; and (d) preparing the final rating scales.

#### Procedure:

A review of the literature and previous experience with enlisted Army soldiers suggested a conceptual model of individual soldier effectiveness. This preliminary model of 15 dimensions served as a starting point for the empirical research that followed. Seventy-seven NCOs and officers from a variety of MOS participated in behavioral analysis workshops and provided more than 1,300 examples of effective and ineffective first-term soldier behavior. Sixty-one NCOs and officers retranslated these behavioral examples, sorted examples into categories, and rated the effectiveness level reflected in each example.

#### Findings:

Seventy-eight percent of the behavioral examples were retranslated consistently into a single category and within a narrow range of effectiveness. All categories and effectiveness levels were well represented based on retranslation results. Two products emerged from the retranslation step: (1) a comprehensive behavioral definition of effective and ineffective performance was prepared for each category; and (2) behavior-based rating scales were developed, with relatively short behavioral statements anchoring the high, middle, and low effectiveness levels of each category.

#### Utilization of Findings:

Behavioral definitions for the categories in the model of soldier effectiveness might be used by first-term soldiers for self-development and by NCOs to develop their soldiers. The comprehensive definitions of effective and ineffective behavior related to each effectiveness category provide a rich

depiction of the performance requirements for a first-term soldier, and this feature of the definitions should be useful in pinpointing the aspects of performance that need improvement.

The behavior-based rating scales will be used in Project A validation research to provide one set of criterion performance scores against which to assess the validity of predictor measures. Supervisors and peers of soldiers will use the scales to rate each soldier's effectiveness, and these performance scores, along with others, will serve as performance criteria in the validity analyses.

# DEVELOPMENT OF A MODEL OF SOLDIER EFFECTIVENESS

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## DEVELOPMENT OF A MODEL OF SOLDIER EFFECTIVENESS

### INTRODUCTION

Project A is a large-scale research program aimed at improving the selection and classification system for assignment to U.S. Army Military Occupational Specialties (MOS). As part of this multiyear effort, experimental predictors, such as vocational interest and temperament measures, computerized perceptual tests, and special cognitive measures, are being developed to help forecast job performance in different MOS. Also being developed are performance measures that will be used to assess the validity of these predictors. The intention is for at least one set of job performance measures to be "Army-wide," (i.e., appropriate for evaluating soldier performance in any MOS).

This report describes work accomplished to define dimensions of effectiveness for U.S. Army first-term soldiers. An initial conceptual and theoretical analysis, along with subsequent empirical research, was intended to define soldier effectiveness constructs appropriate for all first-term enlisted jobs. Specifically, the purpose of this effort was to develop Army-wide criterion constructs to describe effectiveness dimensions for first-term soldiers and to help develop rating scales to use in evaluating soldier effectiveness in any MOS.

#### Developing a Conceptual Model of Soldier Effectiveness

We sought to define a set of criterion behaviors that would include elements of soldier effectiveness not directly related to task performance but related instead to a broader conception of job performance. The notion here was that being a good soldier from the Army's perspective means more than just performing the job in a technically proficient manner. It also means performing a variety of other activities that contribute to a soldier's effectiveness in the unit and to his or her "overall worth to the Army." Our preliminary model presumed that soldier effectiveness could be analyzed according to the conceptual elements that comprise the constructs of organizational commitment, organizational socialization, and morale (Borman, Motowidlo, & Hanser, 1983). The model was derived from a recent review of the literature of these three areas and from an earlier review of the literature on motivation, job satisfaction, and morale in the U.S. Army (Motowidlo, Dowell, Hoppe, Borman, Johnson, & Dunnette, 1976).

Organizational commitment (Porter, Steers, Mowday, & Boulian, 1974; Steers, 1977) refers to the strength of a person's identification with and involvement in the organization and incorporates three kinds of attitudinal and cognitive elements: acceptance and internalization of organizational values and goals; motivation to exert effort toward the accomplishment of organizational objectives; and firm intentions of staying in the organization. The concept transcends job involvement and motivation to perform the specific tasks that comprise the job and connotes a sense of loyalty to the organization as a whole and a desire to fulfill more general role requirements that come with organizational membership. We argue that the behavioral manifestations of organizational commitment may reflect one aspect of this broad conception of soldier effectiveness.

According to Van Maanen and Schein (1979), "organizational socialization is the process by which an individual acquires the social knowledge and skills necessary to assume an organizational role" (p. 211). Some part of this knowledge and skill is, of course, job-specific. For example, training programs designed to improve the effectiveness with which a person performs job-related tasks are part of the process of organizational socialization. But there are also many other non-job-specific knowledges and skills necessary for effective functioning as an organizational member. When the socialization process is successful, a person will acquire not only job-related skills but also new patterns of behavior with subordinates, peers, and superiors in the organization; new attitudes, beliefs, and values in line with organizational norms; and new ways of using time not formally dedicated to performing job-related tasks.

Such individual changes are frequently crucial for assuring that the behaviors of different individual members of the organization will be smoothly coordinated toward accomplishing the organization's mission. As a result, soldier effectiveness might reasonably be regarded as partly a reflection of successful socialization; that is, people whose behavior and attitudes more closely coincide with Army norms might be regarded as more effective soldiers and considered of greater value to the Army.

The concept of morale has traditionally been seen as an extremely important element in military organizations. Munson (1921), a former brigadier general, writes

That their mental state, their will to do, their cooperative effort, their morale--all of which are synonymous--bear a true relation to their output, productivity, and the success of their joint undertaking, is so obvious and has been proven so often as to require no supporting argument. (p.2)

The concept of military morale is multifaceted. It seems to involve feelings of determination to overcome obstacles, confidence about the likelihood of success, exaltation of ideals, optimism even in the face of severe adversity, courage, discipline, and group cohesiveness (Motowidlo et al., 1976). Borman, Johnson, Motowidlo, and Dunnette (1975) report the results of a study designed in part to identify behavioral dimensions of morale in the U.S. Army (see also Motowidlo & Borman, 1977). They found that the following dimensions efficiently describe behavioral expressions of morale among soldiers: community relations; teamwork and cooperation; reactions to adversity; superior-subordinate relations; performance and effort on the job; bearing, appearance, marching, and military courtesy; pride in unit, Army, and country; and self-development during off-duty hours. Because morale seems to figure too prominently as a determinant of unit effectiveness, behavioral dimensions like these may also in part represent important elements of individual soldier effectiveness.

These three broad constructs can be viewed in another way that leads to a more concrete view of soldier effectiveness. From the combination of morale and commitment emerges a general category that can be labeled Determination, which is a motivational and affective category that reflects the spirit, strength of character, or "will-do" aspects of good soldiering. Morale and socialization lead to Teamwork behaviors that have to do with effective relationships with peers and the unit. Commitment and socialization give rise to Allegiance, which taps into acceptance of Army norms with respect to authority; faithful adherence

to orders, regulations, and the Army lifestyle; and being adjusted and socialized to the point of wanting to continue in the soldiering role and stay in the Army.

Each general category of effectiveness subsumes five more specific dimensions. Three dimensions were developed and defined according to our preliminary expectations of how the conceptual elements implied by determination, teamwork, and allegiance might suggest specific behavioral patterns of soldier effectiveness. The dimensions are listed and defined below, together with the broader categories that subsume them:

#### I. Determination

1. Perseverance: struggles tenaciously to reach objectives even when the odds of success seem hopeless; sustains maximum effort over long periods of hard duty with unflagging stamina; versus gives up on objectives that cannot be easily reached; tires out quickly and takes frequent rest breaks.
2. Reaction to adversity: shrugs off severely uncomfortable or unpleasant conditions as though they were trivial; adapts and makes the best of hardship conditions without complaint; refuses to let troubles get him or her down; versus exaggerates the severity of minor discomfort and unpleasantness; constantly complains and grumbles about the lack of amenities; loses perspective and becomes demoralized by insignificant troubles.
3. Conscientiousness: spends extra time and effort to get the job done; consistently completes job and duty assignments promptly on or ahead of schedule; carries out assignments with thoroughness and careful attention to detail; versus refuses to take extra steps to make sure the job gets done; is frequently slow or late in completing assignments; works sloppily and ignores important details.
4. Initiative: volunteers for assignments; anticipates problems and takes action to prevent them; performs extra necessary tasks without explicit orders; versus refuses to volunteer for assignments; waits passively until difficulties occur and reacts only to the immediate problem; does only what explicitly ordered to do.
5. Discipline: devotes full concentration to the job at hand without yielding to the temptation of distractions; controls self-indulgent appetites and does not allow them to interfere with the performance of duty; keeps emotions in check and almost never gets angry; versus easily distracted by opportunities to play, socialize, or pursue other leisure activities; lets too much eating, drinking, sleeping, or other self-indulgent appetites interfere with the performance of duty; fights or destroys property in uncontrolled emotional outbursts with little provocation.

## II. Teamwork

6. Cooperation: voluntarily pitches in when necessary to help other unit members with their job and mission assignments; willingly accepts personal inconvenience to aid other unit members with important problems; takes the trouble to listen and support other unit members with personal difficulties; versus pitches in only reluctantly when asked for job- or mission-related assistance; refuses to help other unit members with important problems if personally inconvenient; shows insensitivity and impatience with other unit members who have personal difficulties.
7. Comradery: is popular and well-liked by other unit members; forms close friendships with other unit members; spends off-duty time in group activities with other unit members; versus is unpopular or disliked by other unit members; frequently quarrels or fights with other unit members; remains aloof and spends off-duty time in solitary activities.
8. Concern for unit objectives: puts unit objectives before personal interests; makes personal sacrifices for the unit as a whole; works hard to meet unit objectives even when they conflict with personal interests; versus refuses to help meet unit objectives when they conflict with personal interests; shows more concern for personal interests than for the welfare of the unit; works for unit objectives only when there is personal gain.
9. Boosting unit morale: helps the unit stick together through hard times; encourages others to keep going when things seem bleak and hopeless; cheers others up when in unpleasant situations; versus shows no concern for unit solidarity; cynically criticizes others who refuse to give in for being foolish and unrealistic; constantly reminds others of the negative or unpleasant aspects of their situation.
10. Emergent leadership: shows good judgment in suggesting ideas for how others in the unit should proceed; persuades others to accept his or her ideas, opinions, and directions; others turn to this person for guidance and advice; versus never or rarely has good ideas for how others in the unit should proceed; presents opinions timidly and indecisively or is pushy and strident in rendering opinions, persuading/ guiding others, etc.; others ignore this soldier's ideas, opinions, directions.

## III. Allegiance

11. Following orders: responds willingly and eagerly to orders, carries out orders promptly and thoroughly; accepts direction from superiors without undue hesitation; versus responds half-heartedly to orders; carries out the letter but not the spirit of orders; refuses to obey orders.
12. Following regulations: complies with rules and regulations; conforms appropriately to standard procedures; tries to correct nonstandard

conditions; versus frequently violates rules and regulations; ignores standard procedures when personally inconvenient; follows the letter but not the spirit of rules and regulations.

13. Respect for authority: defers appropriately to superiors' expertise and judgment; shows good military courtesy and respectful demeanor to superiors; speaks respectfully about superiors in conversations with others; versus habitually questions superiors' expertise and judgment; fails to salute properly or show military courtesy and respect in the presence of superiors; speaks disrespectfully about superiors in conversations with others.
14. Military bearing: grooms and dresses to maintain a crisp military appearance; stands, walks, and marches with an erect military posture; shows pride in the uniform and military insignia; versus grooms and dresses sloppily or without regard to military custom; stands, walks, and marches in a slouchy, casual, or careless manner; shows indifference toward the uniform and military insignia.
15. Adjustment to Army: successfully adjusts to military life; shows pride in being a soldier; wants to stay in the Army; versus fails to adjust to military life; shows indifference; dissatisfaction, or embarrassment about being a soldier; wants to leave the Army.

Figure 1 shows how all of this fits together. The most abstract and broad construct, Soldier Effectiveness, is defined according to somewhat narrower notions of Morale, Socialization, and Commitment, which, with judicious mingling of conceptual elements, produce more concrete categories of Determination, Teamwork, and Allegiance, each of which subsumes five more specific dimensions of soldier effectiveness. Figure 1 also lists these 15 preliminary dimensions of soldier effectiveness.

It should be emphasized that the model was at this point conceptual in nature. However, based on our present review of the literature on organizational commitment, socialization, and morale and on the earlier Motowidlo et al. (1976) review, this heuristic effort did generate hypotheses about possible elements of soldier effectiveness.

#### The Model's Dimensions as Criteria in Selection Research

The point was made that criteria of individual effectiveness, such as organizational commitment, socialization, and morale, may be important as contributors to organizational effectiveness, even though they are not directly task-related. Discussions concerning these links between individual criteria and organizational effectiveness suggest that this may be the case (e.g., Mowday, Steers, & Porter, 1979). Also, recent work on the closely related construct of "organizational citizenship" (Bateman & Organ, 1983; Smith, Organ, & Near, 1983) assumes this kind of linkage between organization members' standing on the dimensions of Altruism (helping other organization members) and Generalized Compliance (a more impersonal form of conscientious citizenship) and positive effects on organizational unit functioning. Confirmation of substantive links between these individual characteristics and organizational effectiveness is hard to come by because of difficulties in measuring the



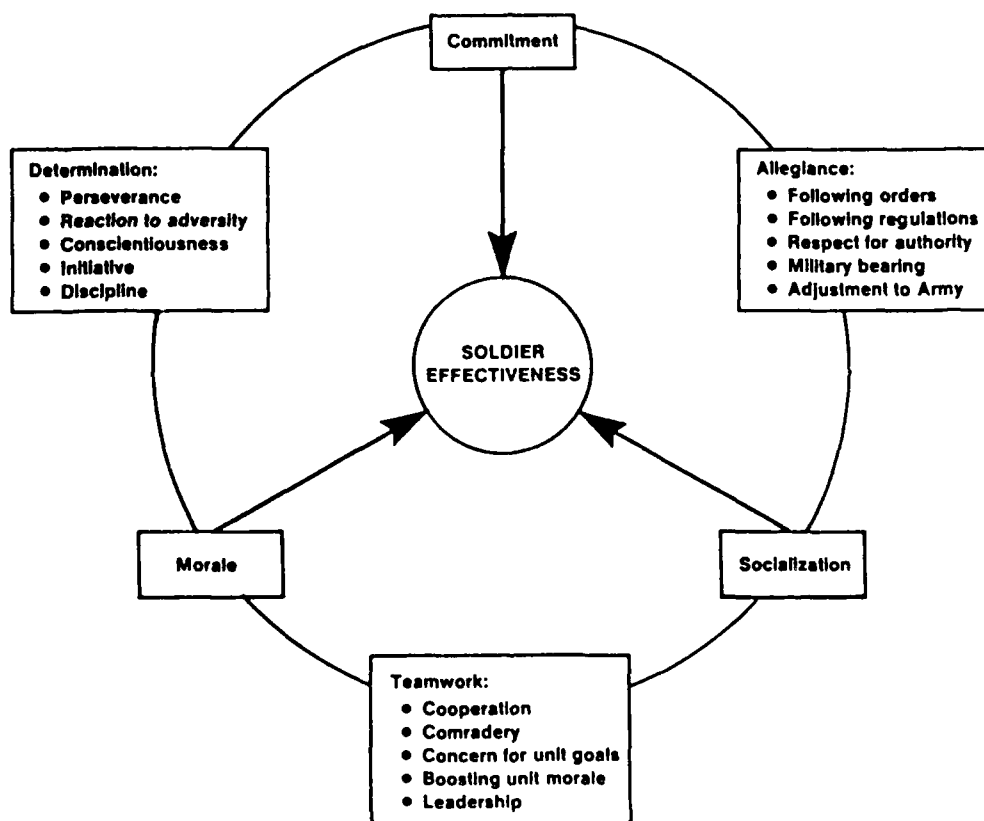


Figure 1. A preliminary model of soldier effectiveness.

effectiveness of organizations (Campbell, 1977). However, on balance, we believe that constructs such as commitment, socialization, and morale are probably important in this regard. Organizations with members who are committed and well adjusted to unit norms should tend to be more effective, at least along certain dimensions.

It follows, then, that in the interests of enhancing organizational effectiveness, an important question is as follows: What are the antecedents and "causes" of a unit member's commitment, socialization, morale, citizenship, and specific other factors represented in the dimensions of soldier effectiveness? Considerable literature presumes that organization-related factors such as job characteristics (e.g., job challenge and task variety, Hackman & Oldham, 1975) control a good deal of the variance in the kinds of variables considered in the model. However, it is also possible that to some extent individuals enter organizations with proclivities toward high or low levels of commitment, adjustment, or morale. This phenomenon could take the form of an interaction between person and organization, where individuals have personal characteristics that make it likely they will be committed or not committed, well adjusted or poorly adjusted, etc., in organizations with certain features.

This idea is not new. Although conventional wisdom states that organizational factors control most of the variance in these kinds of dependent variables, Locke, for example (1969, 1976), has argued for the existence of a person-situation interaction in determining levels of satisfaction (closely related to morale). Individual differences are posited to interact with organizational factors to determine satisfaction. This notion suggests that although features of the organization are important in this context, characteristics the person brings with him or her to the organization may also contribute to satisfaction and perhaps affect the other criteria in the model discussed here.

Related views have been expressed by Blood (1969), Schneider (1976), Schmitt and Schneider (1983), and Pulakos and Schmitt (1983). Blood (1969) found that individual differences in worker values were related to subsequent job satisfaction. Schneider (1976) and Schmitt and Schneider (1983) suggested that individuals' personal characteristics might be important contributors to their satisfaction on jobs, and Pulakos and Schmitt (1983) demonstrated that for graduating high school students certain needs related to jobs correlated positively with satisfaction 9 and 20 weeks into their first job experience.

Related to the model of soldier effectiveness, we submit that other criteria potentially important for organizational effectiveness (in addition to satisfaction) may fit into this framework. That is, individuals' organizational commitment, socialization, and other elements of the model, as well as morale/satisfaction, probably make important contributions to an organization's effectiveness, and further, it may be possible to identify personal characteristics in job candidates that portend high commitment, socialization, morale/satisfaction, etc., in the hiring organization.

The main point then is that those criterion elements of the soldier effectiveness model that extend beyond directly task-related performance criteria may also fit into a personnel selection framework. Provided that these elements are important for organizational effectiveness and that these criteria can be predicted by the skills, abilities, and personal characteristics individuals

bring with them to the organization, the model's dimensions should definitely be considered in addition to task-related job performance criteria in selection research and practice.

### The Need for Empirical Research

The conceptual model described serves as a useful preliminary guide to stimulate thinking about what these dimensions might be. We strongly believe, however, that an empirical analysis must be the cornerstone of this effort to define the domain of soldier performance.

Accordingly, we used a variant of the critical incident or behavioral analysis (Smith & Kendall, 1963) approach. This inductive behavioral analysis strategy (Campbell, Dunnette, Arvey, & Hellervik, 1973) requires persons familiar with a job's demands to generate examples of effective, mid-range, and ineffective behavior observed on that job. In the present application, "job behavior" means any action related to soldier effectiveness. Researchers typically analyze the content of behavioral examples emerging from this step and develop dimensions or categories of job effectiveness. The examples are then "retranslated" by persons familiar with the job by making two judgments about each example--the dimension or category it belongs to based on its content and the effectiveness level it reflects. Examples for which there is disagreement related either to category membership or to the rated effectiveness level may be unclear and require revision or elimination from further consideration. Also, confusion between two or more categories in the sorting of several examples may reflect a poorly formed and/or defined category system. After revising categories according to retranslation results, the final step is to allocate behavioral examples to corresponding scale points on dimensions. The examples thus become "behavioral anchors" for rating scales.

However, scales anchored in this way are sometimes difficult to use because the anchors are so specific that raters frequently complain they cannot find any that match the behavior of the person whose performance they are trying to rate. Consequently, another approach is to summarize behavioral examples that have been rated at approximately the same level on a particular dimension and prepare a more general "behavioral summary statement." This procedure appears to be a highly conceptually sound method for developing rating scales (Borman, 1979). The main advantage of these scales over the traditional behaviorally anchored rating scales is that for a particular dimension and level of effectiveness, the content of all reliably retranslated examples is represented on the scale, not just one of the specific behavioral examples. This makes it more likely that a rater using the scales will be able to match observed performance with performance on the scale. It has been argued (Borman, 1979) that this feature of Behavior Summary Scales is very desirable.

### METHOD

#### Workshops to Generate Behavioral Examples of Effective and Ineffective Soldier Performance

Forty-seven officers and 30 NCOs from a wide range of military specialty areas participated in six 1-day workshops primarily intended to elicit

behavioral examples of effective and ineffective soldier behavior. The NCOs were distributed by rank as follows: 1 SP4, 5 E-5s, 14 E-6s, and 12 E-7s. Among the officers, there were 3 first lieutenants, 29 captains, and 15 majors. Five of the workshop participants were women.

In each workshop, the leader, a member of the research team, first provided an introductory briefing. He or she explained that the workshop was an integral part of a large-scale effort concerned with improving the selection and classification of enlisted soldiers in the U.S. Army. The workshop leader then distributed orientation materials (Appendix A).

Next, workshop participants were led through a training program designed to help them start to write behavioral examples. The training had a modeling orientation in which participants were shown improperly written examples, and then these examples corrected to the proper form. Participants were next asked to write a first behavioral example. Workshop leaders reviewed the first examples and provided corrective guidance as needed. Except for periods taken to discuss behavioral examples or dimensions of effectiveness emerging from the content of the examples, the rest of each workshop was devoted to participants' writing the examples and leaders' reviewing them.

In this manner, 1,315 behavioral examples were generated in the six workshops. Duplicate examples and those that did not meet the criteria specified in training (e.g., the incident described the behavior of an NCO rather than a first-term soldier) were dropped from further consideration. The remaining examples were edited and their content was analyzed to form preliminary dimensions of soldier effectiveness. Three of the authors independently read each example and grouped together examples that described similar behaviors. The sorted examples were then reviewed and the groupings or dimensions were revised until each author arrived at a set of dimensions that were homogeneous with respect to their content. After discussion among project staff and with a small group of officers and NCOs, a set of 13 dimensions was decided upon.

#### Retranslation of the Behavioral Examples

The behavioral examples and dimensions were then readied for retranslation. Specifically, the remaining 1,111 nonredundant examples were placed in retranslation booklet form.

The retranslation task was divided into five parts, with each subtask requiring a retranslation judge to evaluate 216 to 225 behavioral examples. The division into subtasks was done to control the amount of time each judge would be required to spend on the rating task. Each retranslation rater was asked to make two judgments about each performance example in his or her booklet. First, judges sorted the examples into 1 of the 13 dimensions according to perceived content, and second, they rated the effectiveness level reflected in the example. Judges were provided with definitions of each of 13 dimensions to aid in the sorting and a 1 to 9 effectiveness scale (1 = extremely ineffective; 5 = adequate/average; and 9 = extremely effective) to guide effectiveness ratings. Sixty-one officer and NCO judges completed retranslation ratings; thus, each behavioral example was rated by approximately 12 judges (61 retranslation raters each completing one of five booklets). The retranslation materials, including all 1,111 edited behavioral examples, appear in ARI Research Note

87-29, Development of a Model of Soldier Effectiveness: Retranslation Materials and Results, by W. C. Borman, S. J. Motowidlo, S. R. Rose, and L. M. Hanser, which supplements the present report.

## RESULTS

Table 1 lists the 13 dimensions that were developed from content analysis and shows the number of behavioral examples that were reliably retranslated for each of them. We adopted incident acceptance standards of greater than 50 percent for the sorting into a single dimension and less than a 2.0 standard deviation for the effectiveness ratings. This left 870 of the 1,111 examples (78%) included for subsequent scale development work. The effectiveness scale means and standard deviations for each behavioral example, along with the percentage of retranslation raters sorting each example into each dimension, are presented in ARI Research Note 87-29, which supplements the present report.

Most of the dimensions (shown in Table 1) developed by these empirical procedures are quite consistent with dimensions that were theoretically expected according to our preliminary conceptual model. However, the configuration of the two dimension sets is different in some cases, with certain empirical dimensions not matching one-to-one with model constructs.

Empirical dimensions I, J, and K seem to capture elements of the Determination category in our model. Dimensions B, C, and D reflect elements of the Allegiance category, and Dimensions L and M reflect Teamwork. Dimensions A, F, G, and E relate to aspects of both the Determination and Allegiance categories, and Dimension H (Technical Knowledge and Skill), by design, falls outside of the model's domain, although of course it is a very important component of soldier effectiveness. Thus, there is some convergence with the theoretically expected dimensions. We were also gratified to note that, as shown in Table 1, there were sufficient numbers of reliably retranslated examples available to develop extensive behavior definitions of each dimension.

The first two authors considered for each dimension all examples reliably retranslated into that dimension in the above-average range (5 to 9) in writing a behavioral definition of effective performance for that aspect of the model. The same procedure was followed for each dimension in the below-average (1 to 4.99). The content of the reliably retranslated behavioral examples was summarized in a behavioral definition. The result of this exercise was 13 relatively elaborate definitions of effective and ineffective behavior in each of the model's dimensions areas.

However, the length of the behavioral definitions seemed excessive for the rating scales. There was a concern that the amount of reading time required to understand the content of each dimension would cause raters using the definitions as guides for rating soldiers' effectiveness to lose patience with the rating task or otherwise short-cut the rating procedures. Therefore, developing shorter versions of the behavioral definitions for the rating scales appeared advisable. It was also decided that preparing behavioral definitions for three levels of effectiveness (rather than the two provided by the more elaborate definitions) would help raters to differentiate between ratees.

Table 1

Number of Behavioral Examples Reliably Retranslated<sup>a</sup> Into Each Dimension

Dimension	Number of Examples
A. Controlling own behavior related to personal finances, drugs/alcohol, and aggressive acts	107
B. Adhering to regulations and SOP, and displaying respect for authority	158
C. Displaying honesty and integrity	53
D. Maintaining proper military appearance	34
E. Maintaining proper physical fitness	36
F. Maintaining own equipment	46
G. Maintaining living and work areas to Army/unit standards	23
H. Exhibiting technical knowledge and skill	47
I. Showing initiative and extra effort on job/mission/assignment	131
J. Attending to detail on jobs/assignments/equipment checks	59
K. Developing own job and soldiering skills	40
L. Effectively leading and providing motivation to other soldiers	71
M. Supporting other unit members	65
Total	870

<sup>a</sup>Examples were retained if they were sorted into a single dimension by greater than 50% of the retranslation raters and had standard deviations of their effectiveness ratings of less than 2.0.

Finally, again in the spirit of shortening the rating task, two pairs of dimensions were combined; Leading Other Soldiers and Supporting Other Unit Members were combined to form Leading/Supporting, and Attending to Detail and Maintaining Own Equipment were collapsed to form Maintaining Assigned Equipment.

The two collapsings were seen as justifiable because of the conceptual similarity of each of these dimension pairs.

At this point, the first two authors used the reliable retranslated behavioral examples at three levels (1 to 3.49; 3.5 to 6.49; 6.5 to 9) to write behavioral summary statements to capture the content of the specific examples. In the main, this was very straightforward, with the written behavioral statements reflecting the content of many specific examples. For some dimensions, however, because of few examples written to the mid-range of effectiveness, it was necessary to interpolate behavioral content of the high and low effectiveness examples to create the middle-level behavioral summary statements. Consequently, these summary statements are not based quite so solidly on empirical data as are the others.

An example of one of the dimensions with the complete behavioral definition appears as Figure 2 in this report; Appendix B contains a complete set of all definitions. An example of a rating scale appears as Figure 3; Appendix C presents all 11 dimensions. The dimensions are listed and briefly defined in Table 2.

#### DISCUSSION

Our preliminary conceptual model was designed to portray soldier effectiveness in a context broader than just task performance. It presumes that soldier effectiveness involves commitment, socialization, and morale and suggests more specific dimensions that underlie effectiveness in the soldiering role regardless of what the individual's particular job might be. The model served as a useful, conceptual point of departure for subsequent empirical work and as a basis for comparison with empirical results.

The empirical strategy involved gathering behavioral examples of soldier effectiveness from officers and NCOs. Although by no means a formal empirical test of the conceptual model, the behavioral analysis work did yield dimensions similar to those hypothesized by the model. Eleven dimensions emerged and, based on the content of many behavioral examples of soldier effectiveness, were thoroughly defined. Also, behavioral rating scales were developed with shorter behavioral summary statements defining and anchoring three different effectiveness levels of each scale.

In sum, the model of soldier effectiveness, as depicted in the behavioral definitions and the rating scales, offers a behavior-based description of the criterion elements important for first-term soldier effectiveness. These criterion elements, some of them directly relevant to task performance (e.g., Technical Knowledge/Skill), others related to a broader view of soldier effectiveness (e.g., Self-Development), are appropriate for evaluating first-term soldiers in any MOS.

The behavioral definitions (see Figure 2 for an example) springing from the model provide an in-depth description of the performance requirements for first-term soldiers. These behavioral definitions might be used by first-term soldiers for self-development and by NCOs to develop their soldiers.

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## F. Maintaining Assigned Equipment

Checking on and maintaining own weapon/vehicle/other equipment

### Effective Performance

1. Consistently keeping assigned equipment clean, including own weapon and vehicle, as appropriate.
  - Ensuring that weapon and vehicle are constantly up to standard, resulting in high marks on inspections and no deadlining necessary; following proper procedures for cleaning weapon.
  - Painting, polishing or otherwise substantially improving the appearance of assigned vehicle and/or other pieces of equipment when appearance is important.
2. Performing proper checks and preventive maintenance on assigned weapon, vehicle, and other equipment.
  - Properly inspecting all equipment for which responsible to make sure it is safe and that no damage will occur as a result of equipment problems (e.g., always checking on water and oil levels on vehicle).
  - Pulling proper services on vehicle according to schedule and ensuring that all deficiencies are noted; lubricating own weapon and/or other equipment, as necessary.
3. Ensuring that equipment is repaired when necessary.
  - Performing effectively in simple troubleshooting and repair tasks related to maintaining assigned equipment (e.g., weapon, vehicle).
  - On more difficult troubleshooting/repair jobs or as regulations/procedures dictate, ensuring that equipment deficiencies are corrected by appropriate support personnel.

Figure 2. An example behavioral definition.



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### Ineffective Performance

1. Maintaining assigned equipment in dirty and/or sloppy condition, including own weapon, vehicle, and/or gear.
  - Often leaving assigned weapon dirty; failing to keep weapon in combat-ready or ready-for-inspection shape, not cleaning weapon before returning it to ammo room, or failing to follow proper procedures in cleaning weapon.
  - Maintaining dirty and/or rusty gear/equipment such as assigned vehicle, sleeping bag, entrenching tools, etc.; refusing to, being reluctant to, or otherwise failing to ready assigned equipment for important inspections or exercises.
2. Failing to perform or improperly performing checks and preventive maintenance on assigned weapon, vehicle, and other equipment.
  - Inspecting equipment haphazardly, skipping steps in servicing sequence, ignoring safety checks on equipment, etc., such that equipment problems may develop later.
  - Failing to make daily or other routine checks on assigned pieces of equipment resulting at times in no-go inspection marks or even damage to equipment; failing to note deficiencies related to assigned weapon/vehicle/other equipment.
3. Having in possession or actually using assigned equipment in need of repair, even when repair job is easy or repair services are available.
  - Being unable to perform simple troubleshooting and repair tasks related to maintaining assigned equipment (e.g., weapon, vehicle).
  - Even when repair services are available, failing to get equipment to them to get it fixed, or unnecessarily delaying getting it into repair.

Figure 2. An example behavioral definition (continued).

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B. Initiative/Effort

Showing initiative and extra effort on the job/mission/assignment

1	2	3	4	5	6	7
<u>Below Standard</u>		<u>Adequate/Mid-Range</u>			<u>Superior</u>	
<ul style="list-style-type: none"><li>● Refuses to volunteer for assignments or put in extra hours and effort; may even react with hostile attitude when asked to volunteer or work long hours.</li><li>● Gives up easily when faced with obstacles, adversity, or discomfort.</li></ul>		<ul style="list-style-type: none"><li>● Volunteers for some assignments and puts in extra effort when it's very important to do so.</li><li>● Hangs in there with determination when it's really important to overcome obstacles on the job, in the field, etc.</li></ul>			<ul style="list-style-type: none"><li>● Volunteers enthusiastically, takes initiative promptly and effectively when opportunities arise, and voluntarily works long, extra hours to complete assignments even without being asked.</li><li>● Refuses to give in to adversity and pushes on with stamina and guts to overcome all obstacles until the assignment is completed.</li></ul>	

Figure 3. An example Behavior Summary Rating Scale.

Table 2

Final 11 Dimensions and Brief Definitions

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1. Technical Knowledge/Skill  
Displaying job and soldiering knowledge/skill.
  2. Initiative/Effort  
Showing initiative and extra effort on the job/mission/assignment.
  3. Following Regulations/Orders  
Adhering to regulations, orders, and SOP, and displaying respect for authority.
  4. Integrity  
Displaying honesty and integrity in job-related and in personal matters.
  5. Leading and Supporting  
Performing in leader role, as required, and providing support for fellow unit members.
  6. Maintaining Assigned Equipment  
Checking on and maintaining own weapon/vehicle/other equipment.
  7. Maintaining Living/Work Areas  
Maintaining living and work areas to Army/unit standards.
  8. Military Appearance  
Maintaining proper military appearance.
  9. Physical Fitness  
Maintaining military standard of physical fitness.
  10. Self-Development  
Developing own job and soldiering skills.
  11. Self-Control  
Controlling own behavior related to personal finances, drugs/alcohol, and aggressive acts.
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The behavior-based rating scales developed during the research provide a format for generating supervisor and peer assessments of effectiveness in all important aspects of the Army-wide domain. For-research-only ratings on the scales, along with other special performance measures, will be used as criteria in the Project A test validation research.

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